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EXAMINER	
NGO, TANYA T	
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4177	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/590,241	LEHMANN ET AL.
	Examiner	**Art Unit**
	TANYA NGO	4177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/22/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 8 is rejected under 35 U.S.C. 102(b) as being disclosed by Rao et al (herein Rao) PCT Publication WO 03/085423 A2.

Re Claim 8, an optical cross connector (500, Fig. 16) that includes a plurality of 1xM optical signal routers (552, Fig. 16), which includes M optical router outputs (554, Fig. 16) and router input (556, Fig. 16). Since there is a plurality of optical routers, there is also a plurality of inputs into the optical cross connector. Each of the plurality of 1xM optical signal routers(552, Fig. 16) receives one of a plurality of Optical Time Division Multiplexed (OTDM) data signals having a plurality of optical sub channels (paragraph [0151]). The optical signal router includes an optical switch having an electrical modulation input that is electrically coupled to the output of the switch driver and the switch includes an optical input that receives a OTDM signal includes a plurality of sub channels that propagates at a bit-rate (paragraph [0012]). Since there is a plurality of optical routers, there is a plurality of optical switches each configured to have optical signals fed in each instance to one of the optical switches. The LxM cross connector also includes a plurality of optical combiners (588, Fig. 16) (paragraph [0152]). One of the optical routers outputs (544, Fig. 16) of each of the

plurality of 1xM optical signal routers (552, Fig. 16) is optically coupled to one of the M optical combiner inputs (560, Fig. 16) of each of the M optical combiners (588, Fig. 16) (paragraph [0153]). Being that the each optical router output is optically coupled to one of the optical combiners, then it is inherent that the first optical switch, found in the first router, is configured to branch a first number of channels to feed the second optical combiner, and that the second optical switch, found in the second optical router, is configured to branch a second number of channels from the second optical signal to feed the first optical combiner. The maximum number of subsets in the plurality of subsets can be equal to a total of 2^N where N is the number of optical sub channels (paragraph [0057]) and that a selection from the of the plurality of subsets to be to be routed from the optical input to the optical output of the optical switch is determined by the switch driver signal (paragraph [0059]). The switch driver signal is equivalent to the optical control signal because it determines the routing path determined by the optical switches within the router. The means for generating a plurality of optical control signals for controlling the optical switches in through the teach of the switch driver signal and the though that this optical Signal router in the present invention can selection one or more sub channels from many optical sub channels while providing significant flexibility by having the router be dynamically re-configurable to provide substantially real-time routing of optical sub channels (paragraph [0009]). Since there is a plurality of routers in the system, there would inherently be a plurality of optical control signal for each of the routers that would control the switches within the routers.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rao as applied to claim 8 above in view of Handelmann et al (herein Handelman) US PG PUB 2002/0048067 A1.

Re Claim 9, Rao discloses all the elements of Claim 8, which Claim 9 is dependent upon. Rao does not disclose a detection unit within the combiner that determines the occupancy of incoming time-division multiplexed channels. However, it would naturally flow from the combining units (558, Fig. 16) to contain a detection unit because each combiner input (560, Fig. 16) receives a signal from the router outputs (554, Fig. 16) which routes an independently selecting subset of a plurality of optical sub channels of the OTDM signal (paragraph [0153]). Hence, it is necessary for the combiner to contain a detection unit in order to receive the incoming signals from the router because the act of receiving the signal includes the detection of the signal.

Furthermore, Rao does disclose the use of adjustable optical delays in order to synchronize the signals between the routers (552, Fig. 16) and the combiners (558, Fig. 16), but does not disclose that these delays enable for reciprocal time displacement or

reassignment of channels. Handelman discloses an optical switching apparatus and method for optical communication networks using OTDM that discloses the use of delay mechanism that may generate time delays of at least a fraction of the time spacing T between every two series of upstream optical signal samples so as to create a group of n sequentially delayed series in which a delay between every two series of upstream optical signal samples is at least a fraction of T (paragraph [0139]). It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Rao in view of Handelman and have the delay elements capable of reciprocal time displacement in order to prevent the overlapping of signals (paragraph [0144]).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rao as applied to claim 1 above in view of Pau et al (herein Pau) US PG PUB 2004/0208555 A1.

Re Claim 10, Rao discloses all the elements of Claim 8, which Claim 9 is dependent upon. Rao further discloses that the LxM cross-connect (550, Fig. 16) require synchronization among the optical sub channels that are combined by the M optical combiners (558, Fig. 16) which can be achieved locally by adding adjustable delays between the plurality of 1xM optical signal routers (552, Fig. 16) and the M optical combiners (558, Fig. 16) (paragraph [0154]). Rao does not disclose that these delay elements are connected to a control facility. Pau discloses a time slot switching devices that performs switching in the optical domain with signals that are time division multiplexed (TDM) which that includes variable delay lines (Abstract). The control delay lines (332, 334, Fig. 7A) are attached to a

synchronization circuit (702, Fig. 7A) which uses feedback to determine the delays (paragraph [0062]). The examiner is interpreting the synchronization circuit to be the control facility because it determines the length of the delay lines, which determine the delays of the signal. It would have been obvious to one of ordinary skill at the time of the invention to include a control facility, especially one that uses feedback, in order to change the delay lines to accommodate changes in the overall system that may cause slight variations throughout time because it uses real time feedback from the device (paragraph [0062]).

6. Claim 11, 13, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao as applied to claim 8 above in view of Morioka et al (herein Morioka) US Patent 6,023,360.

Re Claim 10, Rao discloses all the elements of Claim 8, which Claim 10 is dependent upon. Rao does not disclose a means for producing a sequence of pulses as control signals for control the addition or branch of channels in a non demultiplexed time-division multiplexed signal. However, Morioka discloses multiple-channel all optical TDM-WDM convert that includes a control optical source (10, Fig. 6) hat generates a control optical pulse train containing N optical frequencies, which is synchronous with optical signal pulse trains of N channels which are to be divided from a TDM optical signal pulse train, and enters an optical wavelength multiplexer (11, Fig. 6) with the TDM optical signal pulse train which enables branching via a wavelength demultiplexer (13, Fig. 6)(Abstract). It would have been obvious

for one of ordinary skill at the time of the invention to include this control optical source because it allows the system to multiplex and demultiplex an optical signal pulse train at high speed without converting the optical signal into an electric signal (Col. 1, lines 20-25).

Re Claim 13, Rao discloses all the elements of Claim 8, which Claim 13 is dependent upon. Rao does not disclose that the means for generating a control signal comprise of a splitter, a number of transit time elements, and optical switch, and a combiner. However, Morioka disclose a control optical source that generates a control optical pulse train containing N optical frequencies, which is synchronous with optical signal pulse trains of N channels which are divided from a TDM optical signal pulse trains (Abstract). The generation of the control optical pulse taught my Morioka beings with a pulse generating optical fiber (21, Fig. 4A) (Col. 9, lines 43-44) which goes into a 1 to N optical dividing means (22, Fig. 4A) which divides the pulse signal components (Col. 9, lines 55-57). The examiner is interpreting the dividing means to be equivalent to the optical splitting means because it splits or divides the original pulse signal into multiple components which the examiner is interpreting to be equivalent to sub-pulses. Each of the multiple components are fend transmitted to optical delay means (24-1 to 24(N-1), Fig. 4A) which makes the transmission optical pulse is delayed for the time that is varied respectively (Col. 9, lines 60-63). The examiner is interpreting the delay means to be equivalent to the transit time elements, because it is al element that varies the transit time for each of the optical pulses. The transit times of these transit elements are also capable for being whole number multiples of bit duration for the are able to be "varied respectively" (Col. 9, line 63) which the examiner is interpreting to be in respect to a common

denominator. The signals are all then sent to an optical coupling device (25, Fig. 4A) and a control optical pulse train is created (Col. 9, lines 66-67), which is equivalent to the combiner that combines all the delayed sub-pulses to form a control signal. Morioka also discloses a switch enabled by the wavelength selective means (23-1 to 23-N, Fig. 4A) (Col. 9, lines 55-57) in series with the time transit elements. The examiner is interpreting to the wavelength selective means to be equivalent to a switch because it only allows a specific wavelength through the path and closes or discontinues the path for other wavelengths, which is the definition of a switch. It would have been obvious for one of ordinary skill at the time of the invention to include the control optical source of Morioka alone with the cross connector disclosed by Rao because it allows the system to multiplex and demultiplex an optical signal pulse train at high speed without converting the optical signal into an electric signal (Col. 1, lines 20-25).

Re Claim 15, Rao and Morioka discloses all the elements of Claim 13, which Claim 15 is dependent upon. Morioka further discloses that the control signals are optical pulses synchronized with the pulses of the data signals (Col. 10, lines 62-66).

Re Claim 16, Rao and Morioka discloses all the elements of Claim 13, which Claim 16 is dependent upon. Morioka further discloses that the splitter comprises a means for splitting an optical pulse enabled by the 1 to N optical dividing means (22, Fig. 4A) which is equivalent because a pulse signal is being divided or split into multiple components (Col. 9, lines 55-57). Furthermore, the system is of generating this pulse by a laser source with a

repetition rate corresponding to the basic data rate because currently it splits an optical pulse, and a laser generated an optical signal, hence the capability.

Re Claim 17, Rao and Morioka disclose all the elements of Claim 13, which Claim 17 is dependent upon. Morioka further discloses that the means for generating the control signal such that the number of sub-pulses corresponds to the number of channels of the TDM signal because the initial pulse is divided into N components each delayed separately, thus creating N number of sub-pulses in the output signal (Col. 9, lines 55-63) where N is the number of channels in the signals that need to be separated (Col. 10, lines 49-51).

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rao as applied to claim 8 above in view of Manning US Patent 5,999,293.

Re Claim 12, Rao discloses all the elements of Claim 8, which Claim 11 is dependent on. Rao does not disclose that the source with means for producing output signals having pulse sequences, the maximum bit rate of which is the bit rate of the TDM signals. However, Manning discloses an optical switch configuration used with OTDM signals that includes a control signal selected so that a desired optical pulses experience a different phase shift so that they would switch to a different output the multiplexer (Abstract). Manning further states in the background of the invention that is has been recognized that in achieving the high possible transmission systems is desirable because it allows for functions such as adding or dropping channels in the optical domain (Col. 1, lines 9-13). Therefore, it would have been obvious for one of ordinary skill at the time of the invention to include the source means for

producing the control signal to have the max bit rate in order to allow for functions such as adding or dropping of channels to happen in the optical domain (Col. 1, lines 9-13) which removes the need for photoelectric converters and such.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rao and Morioka as applied to claim 13 above, and further in view of Khayim et al (herein Khayim) US PG PUB 2003/0210914 A1.

Re Claim 14, Rao and Morioka disclose all the elements of Claim 13, which Claim 14 is dependent upon. Rao further discloses that the optical switch in the router (paragraph [0013]) includes an interferometric switch such as a Mach-Zehnder Interferometer switch (paragraph [0015]). Rao and Morioka do not disclose that the Mach-Zehnder Interferometer switch is combined with a photodiodes. However, Khayim discloses an optical communication system using TDM (paragraph [0022]) that includes a Mach-Zehnder modulator (143, Fig. 20), which is enabled by a Mach-Zehnder Interferometer, in combination with a photodiode in a low frequency signal detecting circuit (145, Fig. 20) because the photodiodes converts the inputted signal into an electric signal containing the normalized signal which by which the original signal can be multiplied by and the optimally retained (paragraph [0017]). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to include a photodiode with the Mach-Zehnder Interferometer in Rao in order to achieve the aforementioned advantage disclosed by Khayim which is the ability to compensation for drift when sending optical signals at high

speed (paragraph [0017]). Furthermore, since this configuration is going to be used in the router of the cross-connecting system disclosed by Rao, it is capable of addition, branching, or time displacement of data of one of the OTDM channels of the TDM signal carried because the signal being inputted to the router is an OTDM signal (paragraph [0154]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TANYA NGO whose telephone number is (571) 270-7488. The examiner can normally be reached on Monday - Friday from 7:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sam Yao can be reached on (571) 272-1224. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngo/
March 12, 2009

/Sam Chuan C. Yao/
Supervisory Patent Examiner, Art Unit 4111